



## **American Barrick Resources Corporation: Managing Gold Price Risk**

During 1992 the financial team of Toronto-based American Barrick Resources Corporation, one of the world's fastest growing and most financially successful gold-mining concerns, met regularly to review strategic and tactical issues related to managing the firm's exposure to gold price risk. Many major gold mines prided themselves on hedging none of the price risk of their output. If unhedged, a gold mine's sole output, and hence its profits, cash flows, and stock price, were tied to gyrations in the price of gold. However, American Barrick had in place a gold-hedging program that was an integral and much publicized part of the firm's corporate strategy. In an environment of falling gold prices, the firm's hedge position had allowed it to profit handsomely and to sell its commodity output at prices well above market rates. For example, in 1992, American Barrick produced and sold over 1,280,000 ounces of gold at an average price of \$422 per ounce, while the market price was about \$345 per ounce.<sup>1</sup>

American Barrick's gold-hedging program, and indeed all the corporate finance and treasury functions of the \$4 billion market capitalization enterprise, were managed by a trio of relatively young but experienced financial executives: Gregory Wilkins (executive vice president and chief financial officer), Robert Wickham (vice president, finance), and Randall Oliphant (treasurer). Messrs. Wickham and Oliphant were responsible for the day-to-day management of American Barrick's highly regarded hedging program, and they reported to and worked closely with Mr. Wilkins. Gregory Wilkins and Robert Wickham had been with the firm since its startup, and Randall Oliphant had joined the firm in 1987.

The gold-hedging program was a distinguishing and permanent characteristic of the firm's strategy, and there was no discussion of abandoning the activity. Nevertheless, the implementation of the hedging program raised a number of issues, and American Barrick's latest gold find, the Meikle Mine, naturally brought to the forefront questions of when, how much, and how to hedge its gold production. The recently announced Meikle Mine Development Project required capital investments exceeding \$180 million and was projected to yield 400,000 ounces of gold annually for 11 years beginning in 1996.

In addition, the processing of unexpectedly rich ore bodies would increase production to a level much higher than was anticipated. While this development was good news, the firm's output would then be hedged far less than planned. Putting on a new hedge position in an environment of

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<sup>1</sup> All figures in this case are expressed in U.S. dollars unless otherwise noted.

*This case was prepared by Professor Peter Tufano and Research Associate Jon Serbin for the purpose of class discussion rather than to illustrate either effective or ineffective handling of an administrative situation.*

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low gold prices and low interest rates challenged the finance team's ingenuity and commitment to its hedging program.

## American Barrick Resources Corporation

Peter Munk, a successful Canadian entrepreneur and financier, was the chairman, chief executive officer, and founder of American Barrick. Although he had had no prior experience in the gold-mining business, he had created and guided one of the world's premier and fastest growing gold-mining firms. From its entry into the gold-mining business in 1983, American Barrick had grown from an equity market capitalization of \$46 million to about \$5 billion by the end of 1992, which ranked it as Canada's eighth largest publicly traded company. From 1984 to 1992 its annual production grew from 34,000 ounces to 1.325 million ounces, and its proven and probable reserves increased from 322,000 ounces to nearly 26 million ounces.

American Barrick's growth came in part through almost annual acquisitions, coupled with good fortune in finding gold on its acquired properties. In 1983 the company purchased interests in small Canadian and Alaskan mines. The next year it purchased an interest in the Pinson Mine in Nevada and acquired the Camflo Mine, which would produce more than 30,000 ounces annually. The Camflo acquisition provided American Barrick with a skilled technical and engineering staff, including Robert Smith, American Barrick's president and chief operating officer since 1985. Camflo almost tripled Barrick's reserve base. In 1985, American Barrick made an even larger acquisition, purchasing the Mercur Mine near Salt Lake City, Utah, from Texaco, Inc. In late 1986 and early 1987, it purchased the Goldstrike Mine and surrounding properties in Nevada. At the time it acquired Goldstrike, reserves on the property were estimated to be about 600,000 ounces. Over the following years, Barrick discovered additional reserves on its Goldstrike property, and by 1992 reserves on the property were estimated to be 20.1 million ounces, and its annual production was approximately 1.1 million ounces. American Barrick's growth was expected to continue through the 1990s as the firm began to look overseas for additional mines. **Exhibit 1** gives information on the firm's operations since its inception.

American Barrick was not only fast growing but also quite profitable. It generated large operating cash flows, which it continued to invest in its mines (see **Exhibit 2**). Its rising profitability, despite the drop in gold prices, came from a variety of sources. American Barrick acquired its gold mines for relatively low prices when gold prices were depressed in the mid-1980s, and it later found massive reserves in Goldstrike that enabled it to enjoy scale economies. In its Mercur Mine the company was able to cut expenses and increase production to capacity, thus increasing profits. Finally, the firm's gold price management program enabled it to sell its output at above-market prices and to profit while other firms could not. **Exhibit 3** provides comparative financial data on American Barrick and its major North American rivals for 1991.

From the outset, American Barrick's mission was set by Mr. Munk's vision. In the early 1980s, he had sensed a demand by European and North American investors for holding gold stocks without the political risks of holding South African investments. In its first annual report as a publicly owned firm, American Barrick expressed its intention to meet this need: "The corporate strategy is to acquire or develop a diversity of gold-producing interests exclusively in North America."<sup>2</sup> It immediately listed its shares in Toronto, Montreal, and the United States, later adding listings in London, Paris, Zurich, Geneva, and Basel.

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<sup>2</sup> As of 1992, all properties of American Barrick were in North America, although it contemplated looking abroad.

A second tenet of the American Barrick strategy was to maintain conservative financial policies by issuing little debt and by moderating the firm's gold price risk. The firm's insistence on bearing low financial risk was attributed to an earlier failed business experience by Mr. Munk and his subsequent distrust of high leverage. It also flowed from his stated belief in the benefits of flexibility: "Our financial strength not only ensures our existing development plans, it will allow us to take advantage of the decade's opportunities." American Barrick's subsequent growth necessitated greater amounts of leverage, but in his 1991 letter to shareholders, Mr. Munk continued to emphasize the importance of having a "strong, liquid balance sheet."

In his original conception, an integral element of financial conservatism was to moderate, although not completely eliminate, American Barrick's exposure to gold price risk. He felt that target investors would be interested in a gold mining firm that lowered the risk of movements in gold prices. American Barrick's appeal would be its positioning as a well-run, low-cost commodity producer, willing to sacrifice potential profits from gold price peaks in order to level out potential losses in the troughs. Investors might desire some exposure to gold prices, but they would want this exposure managed prudently.

In general terms, there are three ways to moderate risk: by diversifying it, selling (or hedging) it, or insuring against it.<sup>3</sup> Given its clear focus on being a gold-mining firm, American Barrick could not diversify away its gold price risk. It could, and did, sell (hedge) and insure against its risk. Its earliest efforts to manage price risk involved selling the risk to others; its later efforts used insurance strategies. While American Barrick had a conservative financial orientation with regard to the level of its indebtedness and the price risk it was willing to bear, it was adept at using innovative financing techniques and instruments to finance itself and manage the firm's financial risk.

By 1992 it appeared that Mr. Munk had communicated the unique features of American Barrick to shareholders. The firm's shares were held by European, Canadian, and U.S. investors.<sup>4</sup> Shareholders included many investors who shied away from traditional gold-mining investments:

Barrick's investor base has now broadened to include institutions that traditionally avoid gold investments. They invest in Barrick because it has an excellent track record, an expectation for future growth, a recognized, proven management team and a strong balance sheet.<sup>5</sup>

Finally, the market seemed to respond positively to American Barrick; its stock outperformed the market and other major gold-mining firms (see **Exhibit 4**).

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<sup>3</sup> See R.C. Merton, *Operation and Regulation in Financial Intermediaries: A Functional Perspective* (Stockholm: Economic Council, 1993) for additional insights into the general treatment of managing risk. To define these three terms, Merton gives the example of the owner of a ship. To manage the risk of loss, a ship owner can (1) diversify by buying a portfolio of ships to avoid a complete loss if one ship sinks; (2) sell (or hedge) the ship and have no economic exposure to its subsequent outcome; or (3) buy an insurance policy that pays off if the ship sinks, but allows the ship owner to profit if it does not. Merton uses the term *hedging* to mean entering into a position such that the payoff is the same regardless of the outcome, which could be accomplished through selling the ship today or entering into a binding forward contract to sell it at some point in the future. In common usage, as at American Barrick, the term *hedging* often refers to risk management activities broadly defined.

<sup>4</sup> An important group of American Barrick shareholders comprised its managers and directors. At the end of 1991, the officers and directors as a group owned directly or indirectly 31.2 million shares, with options to purchase an additional 4.1 million shares. At December 31, 1991, there were 140.9 million shares outstanding. The closing price per share on December 31, 1991, was \$27.875. In 1992, there were 141.9 million shares, of which officers and directors owned 29.6 million. The closing price per share on December 31, 1992, was \$31.00.

<sup>5</sup> "Letter to shareholders," American Barrick Resources Corporation, 1991 annual report, p. 5.

## Gold

While the current primary “uses” of gold were for jewelry (80% of current use) and for industrial and commercial applications such as dentistry and electronics, to understand gold one must appreciate its unique historical role in the international economy as a currency and as a purported hedge against political instability and inflation. Archaeologists have found evidence that gold served as money as early as 2000 B.C., although the use of gold as metallic money is generally traced to its use in Greece in the seventh century B.C. Over the next 3000 years, gold served as a currency and as backing for paper money. In the late nineteenth century, the relation between money and gold was one of great political importance. William McKinley, U.S. presidential candidate and supporter of a gold standard, defeated his opponent, William Jennings Bryan, who insisted that defining currency in terms of gold content would “crucify mankind upon a cross of gold.” Debates over the proper role of gold in a macroeconomy, and its impact on real growth, inflation, and deflation have preoccupied politicians, bankers, and economists for centuries.

In 1992, gold no longer played the central role it once did in the world economy, and hence central banks no longer needed to back up their currency with gold reserves. Freed of requirements to hold gold and aware of the profitability of selling or lending gold, central banks had begun to sell gold. From 1968 to 1991 central bank holdings of gold fell from 886 million ounces to 726 million ounces, a drop of nearly 20%.<sup>6</sup> Canada, Belgium, and the Netherlands announced outright sales of their gold, and other governments saw opportunities to earn profits on their gold reserves through gold lending and participating in the swaps and options markets. Many metals analysts predicted that sales by the official sector would depress the real price of gold, even though industrial demand for gold was projected to outstrip the new supply created by mines.

Some analysts and investors viewed gold as an inflation hedge and a store of value. It was argued that in times of economic and political instability, investors demand gold, driving up its price. It was also commonly held that in times of inflation the purchasing power of gold increases while that of money decreases. Unfortunately, academic research failed to bear out this conventional wisdom. Gold appeared to be an ineffective hedge against inflation and political uncertainty in short and medium horizons, but it may have been effective over long horizons and against cataclysmic events.<sup>7</sup>

**Exhibit 5** plots the price of gold in nominal and real terms, along with the inflation rate, from 1980 to 1992. In the two decades prior to 1992, the price of gold fluctuated from a low of \$24 per ounce in 1971 to above \$850 per ounce in the early 1980s. Prices slid through much of the 1980s, with an upturn around the stock market correction of 1987. Since then, gold prices declined steadily, although daily prices remained quite volatile. Research has shown that gold prices are likely to have more extreme movements, both up and down, than other assets and that positive returns are likely to be followed by subsequent positive returns.<sup>8</sup>

Some analysts predicted that gold would become increasingly commodity-like, enjoying only modest nominal price increases and real price declines. However, large global government deficits might lead countries to monetize their deficits and incite inflationary fears, driving up the demand for gold. Political instability in both South Africa and the former Soviet Union, whose mines

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<sup>6</sup> See Paul H. Zink, *The North American Gold Industry: A Market in Transition*, J. P. Morgan Securities Inc., Equity Research, July 1, 1992.

<sup>7</sup> See E. J. Sherman, *Gold Investment: Theory and Application* (New York: Prentice-Hall, 1986), and Roy W. Jastram, *The Golden Constant: The English and American Experience, 1560-1976* (New York: Wiley, 1977).

<sup>8</sup> See R. Aggarwal and L. Soenen, “The Nature and Efficiency of Gold Markets,” *Journal of Portfolio Management* 14(3), Spring 1988, pp. 18-21, and R. Aggarwal and P. S. Sundararaghavan, “The Efficiency of the Silver Futures Market,” *Journal of Banking and Finance* 11, March 1987, pp. 1-16.

produced 35% of world output, could disrupt supplies of gold. Some commentators voiced fears that the massive sales of gold for future delivery by bullion dealers and mines, taken in aggregate, would continue to depress current prices.<sup>9</sup> Finally, it was always possible that a major new gold field would be found, as in the gold rushes of California (1848), Australia (1851), and South Africa (1886).

## Gold Producers and Production

As producers of commodity products, gold-mining firms had virtually no marketing or distribution costs. There was always a ready market for their product, at market prices, once extracted from the earth and refined. Therefore, a gold mine's profits were a function of the quantity of its production and the difference between the prices at which it sold its output and its costs.

Over the long term, one gold producer can have a competitive advantage over others based on its costs of gold production, driven by the physical features of its gold deposit and the efficiency of the firm's operations. Mines with gold closer to the surface, with ores richer in gold, and with ore in physical forms more amenable to recovery have natural cost advantages over others. Large amounts of ore must be mined, whether in open pits or underground shafts, and then processed to extract small quantities of gold. For example, the ore in American Barrick's Goldstrike Mine contained an estimated .127 ounces of gold for each ton of ore, meaning that to produce a single ounce of gold that might sell for \$300-\$400, American Barrick would need to mine and process almost 16,000 pounds of rock. Once mined, the ore was treated by a combination of processes that included crushing the ore, heating it, sorting by density, chemically treating it, and finally refining to remove impurities. Both mining and processing were costly activities. For example, at Goldstrike, mining and processing costs were roughly equal in magnitude, and costs of mining and processing varied directly with the amount of ore mined and processed.

In the short term, mining firms have a limited ability to adjust production to changes in the price of gold. They can slightly adjust their rate of mining, or they may be able to choose which ore grade to mine and process. For instance, an open pit mine may be able to stockpile ores, allowing the producer to adjust the grade of ore processed depending on market conditions, and underground mines typically have greater flexibility to select the grade of ore they will mine and process. At the extreme, a mining firm can choose to shut down a mine, but practical concerns (e.g., mine floodings) can make this decision nearly irreversible. American Barrick's policy was to mine and produce as much gold as quickly as possible; thus its production decisions were not affected by the market price of gold.

The differences among the major producers in the natural endowments of their mines and the economic efficiency of their operations both caused marginal costs of production to vary widely in the industry (see **Exhibit 3**). Gold mines also needed to make large fixed or sunk costs. The geology and economics of gold mining required firms to invest large sums of money to create the infrastructure necessary to dig and process the ore. For example, the Meikle Mine, American Barrick's newest ore deposit, was projected to demand a capital investment of \$180 million (in 1992 U.S. dollars) spread out over 4 years. The incremental capital investments of this particular project were relatively low, for the new mine lay only one mile north of the firm's Goldstrike properties and could use the same processing and maintenance facilities, and access roads.

Once at full production, the Meikle Mine was expected to produce 400,000 ounces of gold per year for 11 years. If there were no financial contracts by which American Barrick could lock in, or at least set bounds on, the prices at which it could sell the output of the Meikle Mine, the expected value

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<sup>9</sup> See K. Gooding, "Financial Engineering Tames the Gold Market," *Financial Times*, July 26, 1991, p. 24.

of the project could fluctuate widely. Fortunately, the gold industry had at its disposal a wide range of contracts to manage risk, ranging from indexed borrowings to esoteric options. According to analysts of gold-mining firms, American Barrick was not only one of the most active users of these opportunities but also one of the most adept.

## The Diversity of Risk Management Practices in the Gold Industry

The level, type, and horizon of risk management activities varied considerably among gold-mining firms. Australian producers were early and heavy users of risk management vehicles, North American firms tended to use fewer risk management contracts, and South African producers managed little of their price risk. For example, according to estimates by one leading gold analyst, by the end of 1991, Australian producers had hedged 17 months of production, North Americans 9.6 months, and South Africans under 4 months.<sup>10</sup>

Among North American producers, there was a wide range of risk management policies and practices. **Exhibit 6** gives aggregated information about the risk management activities of the North American producers over time. **Exhibit 7** gives survey results showing the risk management activities, as of the end of 1991, of North American producers by level of production. **Exhibit 8** gives details on the risk management activities of the top 11 North American firms.

The degree to which firms managed their output price exposure was well tracked, and firms differentiated themselves on the basis of these policies. At one extreme stood large producers like Homestake, which engaged in no risk management activities whatsoever and justified this policy in public statements:

So that its shareholders might capture the full benefit of increases in the price of gold, Homestake does not hedge its gold production. As a result of this policy, Homestake's earnings are more volatile than those of many other gold producers. The company believes that its shareholders will achieve maximum benefit from such a policy over the long term.<sup>11</sup>

At the other end of the spectrum stood American Barrick, for which managing gold price risk was an integral part of business and one of the firm's four stated business objectives. The value of managing price risk to shareholders was made clear in Peter Munk's letter to shareholders:

Our unique gold-hedging program gives American Barrick extraordinary financial stability. It protects us from the impact of dips in the gold price, allows us to plan our cash flows with confidence, and, in combination with our rising production, offers investors a predictable, rising earnings profile in the future.<sup>12</sup>

Between these two extremes lie a wide variety of firms whose policies evolved over time. For example, in 1990 the management of Battle Mountain Gold announced a major change in policy:

The company expects to hedge up to 25 percent . . . of its first six months' gold production in 1991. This change in strategy was not taken lightly. We have long held the belief that investors appreciate a gold equity which does not cap upside potential

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<sup>10</sup> Ted Reeve, *Global Gold Hedge Survey*, First Boston Equity Research, February 19, 1992.

<sup>11</sup> Homestake, 1990 annual report.

<sup>12</sup> American Barrick Resources Corporation, 1991 annual report.

in gold price rallies. However, a recent study of the market indicates that there may now be a share price premium, rather than penalty, for hedging.<sup>13</sup>

Finally, there were hybrid arrangements where investors could choose to buy shares in identical mines, differing mainly in the degree to which they were protected against gold price movement. For instance, investors could buy the stock of Newmont Gold, which engaged in no gold price risk management. Yet Newmont Gold was 90% owned by Newmont Mining, whose shares were also traded publicly and which managed part of its gold price risk.

## Vehicles for Managing Gold Price Risk

American Barrick's hedging program evolved over the corporation's ten-year history and used a wide range of tools to manage gold price risk. With gold financings, forward sales, options strategies, and spot deferred contracts, American Barrick shed some of its gold price risk while maintaining flexibility to profit from rising gold prices.

### Gold Financings

Before 1986, most of American Barrick's gold price management activities were incorporated in financings for its mines. In 1983, it funded its purchase of the Renabie Gold Mine in northern Ontario by issuing common shares, but then needed an additional \$18 million for capital expenditures to develop the mine. To fund this expansion in February 1984, it raised \$17 million through an innovative vehicle, the Barrick-Cullaton Gold Trust. Marketed in Canada and Europe, this trust was the first publicly traded gold royalty trust in Canada. The gold trust paid investors 3% of the mine's output when the price of gold was at or below \$399 per ounce, rising to 10% of production when gold was at \$1,000 per ounce. In its first annual report, American Barrick explained what it believed to be the win-win nature of this financing:

The investor benefits not only from increased volumes of gold to the Trust but also from increased gold price. Barrick shareholders benefit from the low cost development funds for mine expansion today and only pay increased royalties in future if there are future gold price increases.

The firm used a related structure to raise \$40 million for its Camflo Mine in 1984.<sup>14</sup>

American Barrick's next two large acquisitions used bullion loans and gold-indexed Eurobond offerings to raise capital. To fund the acquisition of the Mercur Mine in 1985, the firm entered into a bullion loan with Toronto Dominion Bank, in which it received 77,000 ounces of gold, which it immediately sold on the market for net proceeds of \$25 million. Over the next 4 1/2 years, American Barrick was to repay the loan in monthly installments in ounces of gold at an interest rate of about 2% per year.<sup>15</sup> The bullion loan was collateralized by the assets of the mine, valued at \$54.3 million, and a guarantee by American Barrick. In addition, American Barrick was required to make accelerated deliveries to the lender equal to 50% of the cash flow from the mine after deducting

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<sup>13</sup> Battle Mountain, 1990 annual report.

<sup>14</sup> In the Camflo transaction, investors got a return of 8% when the gold price was \$365 per ounce, and this rate increased or decreased 1% for each \$35 change in the price of gold to a maximum of \$1,500 per ounce.

<sup>15</sup> In 1988, the company retired this gold loan when it entered into a 125,000 ounce revolving gold loan with a term of 7 years. This loan, collateralized by the assets of the Mercur Mine, required payment of interest at .75% over the gold lease rate, and was amortized over 7 years with quarterly payments.

approved capital expenditures and mandatory deliveries for the preceding year.<sup>16</sup> As part of its massive capital needs to fund Goldstrike and its other properties' capital needs, American Barrick raised funds through additional bullion loans collateralized by its mines. Its 1,050,000 ounce bullion loan used to finance Goldstrike Mine was the largest gold loan in the world at the time. As of the end of 1992, gold loans in place required the firm to deliver the following ounces of gold: in 1993, 33,750 ounces; in 1994, 224,063 ounces; in 1995, 213,125 ounces; and in 1996 through 1997, 315,000 ounces.

American Barrick also raised funds through gold-indexed underwritten offerings. In February 1987, when gold was about \$400 per ounce, the firm offered \$50 million in 2% gold-indexed notes to Euromarket investors, who were typically European fund managers who purchased the issue either for their own accounts or for their clients. Investors paid \$1,308 per note and received annual interest payments of \$26.16. In addition, the investors were entitled to redeem the notes at any time between February 26, 1988, and February 26, 1992. If redeemed at the first possible opportunity, the holder could choose to receive an amount of cash or gold bullion whose value equaled 3.2150 ounces of gold. This redemption amount increased over time so that if it were held to maturity, the investor would receive 3.3804 ounces of gold. Unlike bullion loans, this offering was not collateralized by the firm's mines, whose production had been pledged as collateral for its bullion loans.

## Forward Sales

In a forward sale of gold, a party commits to deliver a specified quantity of gold, at a specific date, for a price set at the beginning of a contract. Before the termination of the contract, no money changes hands. Forward contracts are private over-the-counter transactions between principals, typically for 10,000 ounces or more, and their terms, such as the maturity of the contract and the size of the transaction, can be tailored by the contracting parties. Most forward contracts do not trade before delivery, although the parties are free to close out their positions through a negotiated settlement. As a practical matter, forward sales are usually for relatively short delivery periods of under a few years.<sup>17</sup>

In most markets, forward sellers receive a premium (commonly called contango) above the current gold price. For example, when gold prices are \$350 per ounce, 1 ounce sold for delivery in 1 year might be priced at \$367.50, a premium or contango of 5%. In effect, by contracting today to deliver gold in 1 year, the forward seller earns a guaranteed 5% rate of return.

Contango is equal to the difference between the interest rate for lending dollars and the interest rate for lending gold, called the gold lease rate. If the gold lease rate is 2% per year and the current price of gold is \$350, someone who lends 1 ounce of gold today will be paid back that ounce plus \$7 in cash ( $\$350 \times 2\%$ ) at the end of the year. If the 1-year dollar lending rate is 7% and the 1-year gold leasing rate is 2%, then the contango or premium for selling gold forward is defined to be 5% per year. In this example, if spot gold prices (for immediate delivery) are \$350, and a forward contract is struck for delivery in 1 year, the price for forward delivery at the end of 1 year would be  $\$350 \times (1 + .05) = \$367.50$ . If the forward price differed from \$367.50, bullion dealers and others could earn arbitrage profits. **Exhibit 9** shows the gold lease rate, the dollar interest rate, and contango over time.

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<sup>16</sup> In 1986 the mandatory payments on this loan were 9,282 ounces, and the accelerated payments were 7,937 ounces.

<sup>17</sup> Futures contracts on gold also exist, although American Barrick and other mining firms did not use them in their hedging programs. These futures contracts trade on exchanges such as COMEX. Unlike forward contracts, futures contracts are "marked to market" on a daily basis, requiring daily transfers of funds among the parties. The longest traded futures contract has a maturity of approximately 4 years, although contracts with delivery dates of more than 2 years trade infrequently.

A sharp drop in gold prices in 1984 and 1985 led to the first explicit forward sales of gold at American Barrick. As prices fell to levels equal to the firm's estimated break-even, and threatened to fall even further, the company's profitability was jeopardized. In reaction, American Barrick sold forward about 20,000 ounces in 1984 to protect itself against possible continued declines in gold prices. The gold market soon recovered and prices rose. The forward sales proved costly in hindsight, for the firm lost the opportunity to sell at the higher market prices. Nevertheless, this experience sparked new interest in using the financial markets to manage gold price risk, and Mr. Wickham (treasurer at that time) began to study ways to protect the firm against adverse price movements using forward sales and option strategies. **Exhibit 10** shows the firm's forward sales of gold from 1984 through 1992.

## Options and Warrants

As its forward selling in 1984 and 1985 demonstrated, hedging eliminated American Barrick's downside exposure but also its ability to benefit if prices rose. Beginning in 1987, it began to experiment with option-based insurance strategies that could mitigate the risk of price declines while allowing the firm to retain some of the benefits of rising prices.

In executing a "collar" strategy (also known as a participating min./max. program or a bull spread), the firm simultaneously bought put options and sold call options on gold.<sup>18</sup> The calls and puts had the same maturity, but the exercise price of the puts was below that of the calls. The options were purchased in the over-the-counter market from one of American Barrick's 15 trading partners.<sup>19</sup> By using the premiums received from the sale of calls to purchase puts, a collar strategy required no initial cash outlay, which made it more acceptable to the firm's board of directors.

By adjusting the exercise prices and ratios of puts and calls, American Barrick could determine the degree to which it chose to participate in gold price rises. For example, market prices might allow it to buy one put with an exercise price of \$420 per ounce and sell one call at \$550 per ounce, financing the purchase of the put exactly by the sale of the call, because the two options had the same premium. This pair of market-prices contracts would effectively set a minimum price of \$420 from American Barrick's perspective. Between \$420 and \$550, it would capture all the upside of increases in the price of gold. Above \$550, it would enjoy none of the increases in gold prices. Instead of selling one call with an exercise price of \$550, the prevailing market prices for gold options might permit it to sell .5 calls with an exercise price of \$485 and receive the same premium. Then, it would benefit fully from all price increases between \$420 and \$485 and would enjoy half of all increases above \$485.

**Exhibit 11** shows American Barrick's option portfolio over time. As the firm became more comfortable with options, its positions grew. But as spot prices declined, it lowered the call strike price and the put/call ratio of its collar positions so as not to allow its floor level to drop. This meant that the firm had to surrender more of the upside potential to protect against drops in gold price. Furthermore, the over-the-counter market in which it transacted with other principals rarely wrote options contracts longer than 5 years, and the market was liquid only for contracts with maturities under 2 years. This horizon was far shorter than the 20 years of expected production currently in reserve. In 1990 the firm stopped adding new options positions, and began to use spot deferred contracts extensively.

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<sup>18</sup> A put option gives the holder the right to sell an asset on a certain date for a prespecified exercise price. A call option gives its holder the right to buy an asset on a certain date for a prespecified exercise price.

<sup>19</sup> Alternatively, it could have bought and sold gold options (and options on gold futures) on a number of organized exchanges, including the COMEX (N.Y.), the European Options Exchange (Amsterdam), and the London International Financial Futures Exchange. Exchange-traded gold options have maturities under 1 year.

## Spot Deferred Contracts

A spot deferred contract (SDC) was a type of forward sale of gold. In a standard forward sale, a delivery date is set, and on that date the forward seller delivers gold to the buyer at the prearranged forward price. In an SDC, there are multiple delivery dates, with the final one being 5 or 10 years after the initiation of the contract. The SDC seller chooses on which of these rollover dates it will deliver the gold and has the right to defer the delivery until the end of the contract. Ultimately, the SDC seller must deliver the quantity of gold called for in the contract, but it has a choice when to deliver it.

At the initiation of a spot deferred contract with 1-year delivery or rollover dates, the prices paid for delivery were set only for the first rollover date. Gold that American Barrick delivered at the end of the first year would be paid the 1-year forward price. At that rollover date, American Barrick could deliver on the contract (if the contract price was higher than spot), or it could roll the contract forward to the next period and sell the gold in the spot market. If it chose the latter alternative, no money or gold would change hands between the SDC trading partners at this time, and the price would be set for delivery of gold on the next rollover date. The price set for delivery in the next period would be based on the prior contract price plus the prevailing contango premium on the rollover date. From both American Barrick's and its trading partner's perspectives, the price for the next rollover would be set such that both parties would be indifferent between rolling over the contract for another year and closing out the contract and initiating a new 1-year forward contract.<sup>20</sup>

American Barrick's initial SDC trading agreements called for ultimate delivery within 3 or 4 years, but as a result of its large reserve base and strong financial position, it was able to negotiate subsequent agreements giving the firm 10 years within which to make delivery. SDC contracts were typically written by large producers with bullion dealers, covering no less than 100,000 ounces of gold. An integral feature of spot deferred trading agreements was the covenants that the company's 15 trading partners required it to meet. If American Barrick's finances weakened considerably or if its reserves deteriorated, its ability to continue to roll over its positions could be suspended. Weaker mining firms (with low reserves, high costs, and high leverage) were unable to enter into long-term SDCs or may have been required to deposit funds with their trading partners (or post margins) at each date when the contracts were rolled over.

American Barrick saw spot deferred contracts as a way to profit from increases in the price of gold and yet set a minimum price on its sales of gold. Since 1990, American Barrick's use of SDCs grew rapidly, supplanting its other hedging vehicles, with 1,035,000 ounces pledged to contracts in place at the end of 1990, 2,248,202 ounces at the end of 1991, and 4,341,827 ounces at year-end 1992. As it became more comfortable with SDCs, American Barrick began to experiment with vehicles to manage the inherent contango risk of these contracts by using interest rate forwards and options.

## Summary: Hedging at American Barrick

Through the 1980s and early 1990s, as American Barrick's reserves and financial strength improved and the market for gold-hedging vehicles matured, the company's risk management

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<sup>20</sup> If American Barrick were to roll 1-year forward contracts, it would be required to recognize its gains or losses on these contracts at the end of each year for both taxes and financial reporting. The tax and financial reporting treatment of the newer SDCs was unclear, as they had not been tested in the courts. American Barrick's legal counsel believed that because SDCs were long-term contracts for which delivery was not required in the short-term, no gains or losses would be recognized on these trading agreements before the company delivered gold against its SDC commitments.

activities grew in size and complexity. Moving from gold financings to forwards to options to spot deferred contracts, the firm used virtually every instrument available to manage its gold price risk.

Gold price risk management at American Barrick evolved out of the conservative financing orientation of the firm. However, specific events in the corporation, like the 1984 experience with selling gold forward or the discovery of nearly 18 million unexpected ounces of gold reserves at Goldstrike, accelerated the pace at which hedging activity took place. With Goldstrike, American Barrick's board set a guideline for risk management: The firm would be fully protected against price declines for all production out 3 years, and 20%-25% protected for the following decade. Specific details of the methods and implementation were left to the financial team, who reported the firm's position to the board of directors on a regular basis.

While the program was dedicated to ensuring that American Barrick was protected against falls in the price of gold over the long term, in the short term the financial team strategically managed its positions to capitalize on its expectations of movements in the price of gold. For example, in early January 1991, gold prices were about \$386 per ounce. Later that month, as military forces massed near the border of Kuwait, the price of gold began to rise. On the evening of January 17, 1991, while President George Bush made a television address telling of the initiation of Operation Desert Storm, gold prices surged to almost \$410. In roughly an hour, the company's finance team sold approximately 1 year of production in the spot market to capitalize on what it perceived was a short-term uptick in prices. The bet proved correct, for gold prices later in the year never approached this level.

Because it lacked the technical training and in-house models to price the various gold derivatives, the financial team made a point of obtaining competitive quotes for its derivative transactions. Given American Barrick's financial strength and reserve base, the finance team felt that it could enter into contracts that many other mines and most gold stock investors could not. Furthermore, the terms of these contracts were more favorable than those other mining firms and investors would receive. Over time, as the finance team became more proficient at using the derivatives, it began to develop customized contracts using financial instruments available from major dealers.

American Barrick's largest positions were established in conjunction with Goldstrike when gold prices were much higher than in late 1992. As a result, as gold prices declined, American Barrick was able to deliver its production against contracts for prices far above market prices and would continue to be able to sell above market prices. **Exhibit 12** shows the spot prices of gold and the average price that American Barrick realized on its sales throughout the firm's history.

American Barrick made a point of communicating its risk management program to the investing public. **Exhibit 13** is an excerpt of information about the program presented to analysts, including published details of the firm's hedge position. The firm's hedging was prominently mentioned in public reports (including on the cover of the 1990 annual report), and executives gave speeches and wrote articles about the firm's hedging activities. Using publicly available information, analysts attempted to value its futures, options and SDC positions, and while these estimates differed, there was a broad consensus that these financial transaction activities had proven to be wise choices in hindsight.

## Pleasant Surprises Challenge the Hedging Program

In 1991 and 1992, American Barrick's good luck in the mine fields put new demands on the firm's hedging program. In September 1989, the firm's geologists began exploring the "Purple Vein," located one mile north of its Goldstrike property. While these early explorations turned up 10

of 17 holes drilled, the amount, the technical feasibility, and the economic attractiveness of the find could not be determined by the end of 1989. The gold lay under the water table at depths where the ground water temperature was over 140° F. In 1990 exploration continued with an additional 31 holes drilled, which indicated that perhaps over 5 million ounces of gold lay in the deposit. But the technical details of mining the gold were daunting, and over the coming year technicians would need to visit deep-shaft South African mines and consult with ventilation and cooling engineers to ensure that the gold could be extracted. During this time, there was substantial technical uncertainty.

Finally, in February 1992, the firm felt confident that the ore could be extracted, and it publicly announced the proven and probable reserves of 4.5 million ounces, renaming the mine the Meikle Mine in honor of the American Barrick executive who was instrumental in acquiring and exploring the Goldstrike property. In its public release announcing the mine, analysts were told, "Given full consideration of the risks inherent in mine development, it has been determined that the economics of the deposit are very attractive even at \$350 per ounce gold," although the break-even of the mine was far lower than \$350 per ounce. See **Exhibit 14** for details of the Meikle Mine project. Construction would not be completed until 1995, and full production would commence in 1996. The finance team had to determine when, during the period in which Meikle was being explored and then constructed, it would begin to manage the price risk of the mine's production and which mix of instruments it would use.

While Meikle promised to boost the firm's production in the long term, good fortune unexpectedly produced a new challenge for the hedging program in the short term. In the fourth quarter of 1992, engineers determined that American Barrick's mined ore was richer in gold than originally anticipated. The firm had planned to produce roughly 1.2 million ounces annually of gold by 1995 and had hedged itself fully at this level for the period 1993-1995. The newer estimates suggested that production would be closer to 2 million ounces annually by 1995; thus the firm suddenly became substantially more exposed to gold price swings as measured against its policy guidelines.

With the price of gold and interest rates at historically low levels, the sudden need to enter into options, forwards, or SDCs became more complicated for American Barrick. While industrial demand for gold was projected to outstrip newly mined supply, and the large bullion sales by the central banks had been absorbed, gold prices were not projected to increase. While some analysts projected a rebound in gold prices with higher U.S. inflation because of President Clinton's economic proposals, others discounted the possibility of inflation. Furthermore, the proliferation in interest rate, currency, and commodity derivatives gave investors alternatives to manage inflation risk more directly and efficiently than gold. Many held that despite upheavals around the world, the fear of global war had declined, and gold would not be bid up in these relatively peaceful times. With the fall in the price of gold, mining firms were reported to be cutting back exploration and development efforts, and analysts estimated that perhaps one in three mines was unprofitable at current prices.

**Exhibit 15** shows the price of gold, along with capital market rates, and representative quotes on various gold derivatives available to the American Barrick financial team at the end of 1992. The team needed to decide what to do: whether to stand committed to the guideline of managing all of the price risk of next 3 years' production, and, if so, how to deal with the unexpected 1.7 million ounces of additional production for that period.

## Exhibit 1 American Barrick's Operations 1984-1992

	1984	1985	1986	1987	1988	1989	1990	1991	1992
<b>Gold Production (oz.)</b>									
Renabie Mine, Ontario	8,098	14,858	17,504	19,307	19,408	20,051	21,751	15,187	—
Valdez Creek, Alaska	3,880	5,878	3,108	7,501	10,436	13,975	—	—	—
Camflo, Quebec	18,500	34,637	31,850	29,763	30,888	26,629	24,416	25,001	36,273
Pinson Mine, Nevada	3,600	8,289	22,603	20,116	21,612	19,028	15,966	15,504	13,376
Holt-McDermott Mine, Ontario	—	—	—	—	23,848	63,354	59,164	60,728	43,325
Mercur Mine, Utah	—	52,290	111,007	108,278	115,390	117,536	122,043	127,280	121,239
Goldstrike, Nevada	—	—	—	40,144	119,418	207,264	352,880	546,146	1,108,219
<b>Total</b>	<b>34,078</b>	<b>115,952</b>	<b>186,072</b>	<b>225,109</b>	<b>341,000</b>	<b>467,837</b>	<b>596,220</b>	<b>789,846</b>	<b>1,322,432</b>
<b>Proven and Probable Gold Reserves (oz.)</b>									
Renabie Mine, Ontario	100,000	85,000	159,100	123,200	98,200	112,000	27,700	—	—
Valdez Creek, Alaska	—	23,000	39,600	28,400	51,300	94,700	—	—	—
Camflo, Quebec	170,000	135,000	102,000	91,200	76,800	62,100	44,800	19,900	—
Pinson Mine, Nevada	52,000	123,000	123,800	115,500	129,500	130,000	105,700	100,500	83,700
Holt-McDermott Mine, Ontario	—	476,000	456,000	308,000	249,000	354,400	387,100	447,300	251,200
Mercur Mine, Utah	—	1,000,000	1,400,000	1,467,000	1,297,100	1,127,700	1,027,100	876,300	739,800
Goldstrike, Nevada	—	—	625,300	8,679,100	15,181,000	17,995,700	17,918,000	18,448,000	20,149,000
Meikle Mine, Nevada	—	—	—	—	—	—	—	4,485,000	4,485,000
<b>Total</b>	<b>322,000</b>	<b>1,842,000</b>	<b>2,905,800</b>	<b>10,812,400</b>	<b>17,082,900</b>	<b>19,876,600</b>	<b>19,510,400</b>	<b>24,377,000</b>	<b>25,708,700</b>
<b>Cash Cost/Ounce<sup>a</sup></b>									
Renabie Mine, Ontario	\$376	\$253	\$239	\$283	\$353	\$360	\$373	\$301	—
Valdez Creek, Alaska	270	237	324	469	451	308	—	—	—
Camflo, Quebec	200	214	219	237	272	294	319	295	164
Pinson Mine, Nevada	175	169	133	169	157	178	215	238	260
Holt-McDermott Mine, Ontario	—	—	—	—	268	284	298	331	356
Mercur Mine, Utah	—	248	199	216	235	253	238	249	259
Goldstrike, Nevada	—	—	—	\$312	\$325	\$352	\$393	\$318	\$199
<b>Weighted Average Cash Cost/oz.</b>	<b>\$247</b>	<b>\$217</b>	<b>\$200</b>	<b>\$246</b>	<b>\$280</b>	<b>\$307</b>	<b>\$343</b>	<b>\$305</b>	<b>\$210</b>

Source: American Barrick Corporation, annual reports.

a. Cash costs include site costs for all mining (including deferred stripping costs), processing, and administration, but do not include royalties, capital costs, exploration costs, resource taxes, depreciation, and financing costs.

Exhibit 2 American Barrick's Financial Performance, 1983-1992 (thousands of dollars except per share data)

	1983	1984 <sup>a</sup>	1985 <sup>b</sup>	1986	1987	1988	1989 <sup>c</sup>	1990	1991	1992
<b>Balance Sheet Data</b>										
<b>Assets</b>										
Cash and short-term investments	\$3,093	\$1,041	\$2,110	\$2,215	\$167,163	\$51,411	\$304,673	\$311,778	\$252,140	\$288,023
Note receivable	—	—	—	—	46,161	—	—	—	—	—
Marketable securities	—	1,460	455	99,478	312	—	—	—	—	—
Bullion settlements and other receivables	2,527	5,650	4,044	6,439	9,841	16,786	28,314	32,601	35,193	25,100
Inventories and prepaid expenses	437	1,961	7,547	9,596	15,946	18,760	35,067	46,852	41,114	40,248
Current assets	6,057	10,112	14,155	117,727	239,423	86,957	368,054	391,231	328,447	353,371
Investments	—	33,102	15,332	15,120	120,005	143,144	32,526	—	—	—
Property, plant, and equipment	31,158	122,644	126,760	171,151	289,304	455,776	633,791	716,046	921,701	1,094,402
Other assets	3,207	2,630	9,082	14,885	27,050	14,958	15,698	39,606	56,189	56,520
<b>Total assets</b>	<b>\$40,422</b>	<b>\$168,489</b>	<b>\$165,329</b>	<b>\$318,884</b>	<b>\$675,785</b>	<b>\$700,825</b>	<b>\$1,050,069</b>	<b>\$1,146,883</b>	<b>\$1,306,337</b>	<b>\$1,504,293</b>
<b>Liabilities and Equity</b>										
Accounts payable and accrued liabilities	\$ 4,165	\$ 6,950	\$ 11,627	\$ 16,793	\$ 24,811	\$ 26,209	\$ 42,019	\$ 28,528	\$ 54,532	\$ 58,804
Dividend payable	—	—	—	—	—	—	—	—	3,105	—
Notes and loans payable	1,365	26,323	4,102	53,658	—	—	—	—	—	—
Current part of long-term debt <sup>d</sup> & deferred revenues <sup>e</sup>	—	311	934	24,536	27,807	16,860	46,760	82,973	54,624	79,968
Current liabilities	5,530	33,584	16,663	94,987	52,618	43,069	88,779	111,501	112,261	138,772
Long-term debt <sup>d</sup>	2,783	41,490	9,619	61,942	137,010	91,834	61,271	331,401	262,996	260,098
Deferred revenues and other liabilities <sup>e</sup>	—	5,293	65,894	47,598	142,104	164,300	358,114	31,193	47,989	62,117
Deferred taxes	—	7,070	6,208	5,565	5,612	11,147	16,387	27,912	42,438	50,577
<b>Total liabilities</b>	<b>8,313</b>	<b>87,436</b>	<b>98,384</b>	<b>210,093</b>	<b>337,645</b>	<b>310,350</b>	<b>524,551</b>	<b>502,007</b>	<b>465,684</b>	<b>511,564</b>
Capital stock	37,845	100,175	103,389	98,315	315,850	325,562	427,509	534,707	653,102	664,410
Retained earnings	(5,736)	(19,121)	(36,444)	10,476	24,144	49,799	77,140	92,745	169,766	326,273
Foreign currency translation adjustment	—	—	—	—	(1,557)	15,124	20,869	17,424	17,785	2,046
<b>Shareholders' equity</b>	<b>32,109</b>	<b>81,053</b>	<b>66,945</b>	<b>108,791</b>	<b>338,437</b>	<b>390,485</b>	<b>525,518</b>	<b>644,876</b>	<b>840,653</b>	<b>992,729</b>
<b>Total liabilities and shareholders' equity</b>	<b>\$40,422</b>	<b>\$168,489</b>	<b>\$165,329</b>	<b>\$318,884</b>	<b>\$675,782</b>	<b>\$700,835</b>	<b>\$1,050,069</b>	<b>\$1,146,883</b>	<b>\$1,306,337</b>	<b>\$1,504,293</b>

## Exhibit 2 (continued) American Barrick's Financial Performance, 1983-1992 (thousands of dollars except per share data)

	1983	1984 <sup>a</sup>	1985 <sup>b</sup>	1986	1987	1988	1989 <sup>c</sup>	1990	1991	1992
<b>Income Statement Data</b>										
Revenues	\$1,286	\$4,407	\$37,327	\$69,106	\$92,127	\$147,509	\$206,069	\$251,624	\$344,725	\$540,437
Operating expenses	(1,180)	(7,635)	(23,315)	(39,482)	(48,090)	(79,545)	(111,010)	(132,356)	(175,357)	(234,205)
Administrative expenses	(1,197)	(2,312)	(2,607)	(4,036)	(5,547)	(6,756)	(8,728)	(10,570)	(11,951)	(14,241)
Income from operations	(1,091)	(5,540)	11,406	25,588	38,490	61,208	86,331	108,698	157,417	291,991
Depreciation, depletion, and amortization	(351)	(3,504)	(8,845)	(11,868)	(17,383)	(25,681)	(35,266)	(42,954)	(49,277)	(68,971)
Exploration and deferred mining costs written off	—	—	(345)	(135)	(3,010)	(501)	(8,299)	(6,925)	(3,465)	(4,310)
Interest and other income	215	3,509	5,315	4,547	10,658	15,369	21,945	31,487	23,961	13,330
Interest expense on long-term obligations	—	(4,343)	(2,935)	(3,844)	(9,985)	(10,671)	(12,770)	(12,787)	(9,427)	(9,296)
Other expenses	—	—	—	—	8,287	—	(9,487)	—	(4,243)	—
Income before taxes	(1,226)	(9,878)	4,595	14,288	27,057	39,724	42,454	77,519	114,966	222,744
Income taxes	—	822	1,500	2,700	6,487	9,229	8,719	19,314	22,526	47,804
Net Income	(\$1,226)	(\$9,056)	\$3,095	\$11,588	\$20,570	\$30,495	\$33,735	\$58,205	\$92,440	\$174,940
Net income per share	(\$0.02)	(\$0.12)	\$0.08	\$0.28	\$0.18	\$0.26	\$0.28	\$0.45	\$0.68	\$1.22
<b>Statements of Cash Flow</b>										
Cash from operations	\$71	\$12,646	\$24,466	\$37,276	\$61,693	\$76,801	\$94,040	\$160,233	\$282,782	
Cash from investment activities	(99,015)	(20,682)	(95,679)	(192,871)	(195,175)	(114,569)	(160,263)	(303,346)	(272,209)	
Cash from financing										
Capital stock	63,392	3,250	31,389	213,190	7,316	102,252	107,198	118,395	11,308	
Renabie Gold Trust <sup>f</sup>	5,762	—	—	—	—	—	—	—	—	
Long-term liabilities	5,505	2,471	—	—	—	—	—	—	—	
Gold-linked 5.25% notes <sup>g</sup>	—	—	52,903	—	—	—	—	—	—	
Gold Company of America	—	40,778	—	—	—	—	—	—	—	
Gold loans and long-term liabilities: proceeds	—	26,826	—	171,004	50,166	218,818	—	—	77,000	
Gold loans and long-term liabilities: repayments	—	(40,563)	(13,178)	(13,427)	(74,357)	(22,024)	(21,940)	(76,806)	(40,172)	
Gold purchase warrants <sup>h</sup>	—	—	4,248	—	—	—	—	—	—	
Note receivable <sup>i</sup>	—	—	—	(46,161)	46,161	—	—	—	—	
Dividends	—	—	—	(2,220)	(4,840)	(7,896)	(11,263)	(15,000)	(18,433)	
Other <sup>j</sup>	(2,716)	(959)	(1,914)	(1,441)	(2,466)	(796)	(1,019)	1,826	(3,105)	
	71,944	31,803	73,446	320,945	21,980	290,354	72,976	28,415	26,598	

**Exhibit 2 (continued) American Barrick's Financial Performance, 1983-1992**

Source: American Barrick Resources Corporation, annual reports.

Note: Financial data for 1983-1987 were originally reported in Canadian dollars. Subsequent American Barrick financial reports translate these into U.S. dollars at a fixed rate of .77 US\$/C\$. This convention is used here.

- a. Does not include 1984 extraordinary loss of \$9,523,000 attributable to divestment of nonmining properties (oil and gas).
- b. Does not include 1985 extraordinary loss of \$20,305,000 attributable to divestment of nonmining properties (oil and gas).
- c. In 1989, Barrick changed the way it accounted for exploration and deferred stripping costs. Financials for previous years have not been restated to reflect this change. Accordingly, there is a mismatch in some accounts when comparing pre-1989 data.
- d. Long-term debt includes gold loan obligations at original value.
- e. Deferred revenues include gains arising from early repayment of gold loans and adjustments made to value the loan at market prices prevailing at the balance sheet date. In earlier years, deferred revenues included all gold loan obligations as well as long-term obligations to financing trusts and purchase contracts. Other liabilities include reserves for future environmental and land reclamation costs.
- f. The Renabie Gold Trust receives a variable percentage of Renabie production, which varies from 3% to 10% based on the price of gold.
- g. The Gold Company of America entered into gold purchase agreements to purchase gold from the Camflo mine. The percentage of the contract delivered each year varies with the price of gold. The rate is 8% at \$365 gold and increases or decreases by 1% for each \$35 change in the price of gold.
- h. In September 1986, the company issued 2 million units at \$21.5/unit consisting of one common share and two gold purchase warrants. Each warrant entitled the holder to purchase .02 oz. gold at \$9.50 until September 1990. At issue, the warrants were valued at \$1.50 each.
- i. A portion (\$46.1 million) of the proceeds from the October 1987 equity issue was used to purchase a note receivable, which was repaid in 1988.
- j. Also includes costs incurred in raising capital.

**Exhibit 3** Operating and Financial Performance of Major Gold Mining Firms in 1991 (millions of dollars except per share and per ounce data)

	American Barrick	Amax Gold	Battle Mtn <sup>f</sup>	Echo Bay	FMC Gold <sup>f</sup>	Homestake Mining	LAC Minerals	Newmont Gold <sup>g</sup>	Newmont Mining <sup>g</sup>	Pegasus Gold	Placer Dome
<b>Operating information</b>											
Production (000 oz.)	789.8	300.2	408.0	733.9	357.0	1,045.2	1,040.0	1,576.9	1,420.9	315.3	1,684.0
Average realized price/oz. <sup>a</sup>	\$438	\$427	\$368	\$392	\$361	\$361	\$413	\$363	\$391	\$389	\$399
Cash costs/oz. <sup>b</sup>	\$205	\$195	\$178	\$249	\$210	\$307	\$245	\$203	\$203	\$226	\$223
Total costs/oz. <sup>c</sup>	\$274	\$346	\$376	\$390	\$343	\$448	\$390	\$288	\$288	\$351	\$415
Total reserves (million oz.)	25.3	6.2	7.1	1.3	2.6	13.2	10.6	20.1	18.1	4.0	16.8
Reserve replacement costs/oz. <sup>d</sup>	\$13	\$17	\$19	\$23	\$66	\$29	\$33	\$9	\$9	\$54	\$104
<b>Risk management activities</b>											
Percent of 1992 production "hedged" <sup>e</sup>	94%	50%	0%	15%	0%	0%	80%	0%	29%	68%	24%
Average price/oz. of "hedged" production <sup>e</sup>	\$424	\$497	—	\$417	—	—	\$396	—	\$431	\$380	\$421
Percent of debt gold-linked	100%	6%	0%	100%	0%	0%	26%	—	100%	25%	4%
Percent of revenue from gold sales	100%	100%	95%	91%	92%	94%	85%	100%	89%	79%	70%
<b>Financial information (\$ million)</b>											
Cash flow from operations	\$160.23	\$50.90	\$53.84	\$97.57	\$48.91	\$23.80	\$122.95	\$181.77	\$98.33	\$32.56	\$276.60
Cash flow from investment	(303.35)	(53.70)	(125.92)	(56.34)	(21.19)	(45.23)	(184.48)	(176.46)	(83.68)	(38.33)	(354.00)
Cash flow from financing	28.42	12.10	8.16	(52.32)	(3.67)	(50.16)	126.42	(5.24)	(126.13)	60.14	(26.90)
Capital expenditures	245.50	60.00	147.00	60.00	19.40	138.42	95.15	97.27	95.50	38.70	226.00
Total assets	1,306	198	525	875	275	927	1,346	817	818	351	2,291
Total debt	336	26	128	234	127	52	348	0	224	71	310
<b>Stock price information</b>											
Shareholders' equity (book) value	\$841	\$198	\$315	\$492	\$244	\$669	\$778	\$735	\$201	\$246	\$1,481
No. of shares (millions) 12/31/91	140.9	60.6	79.8	105.1	73.5	99.5	146.9	104.9	67.8	27.9	236.7
Closing price per share (12/31/91)	\$27.88	\$11.63	\$7.88	\$7.50	\$5.00	\$16.00	\$8.13	\$39.75	\$40.38	\$12.37	\$11.00
Standard deviation of returns (1988-1992)	.020	.024	.027	.025	.028	.024	.024	.021	.020	.025	.021
% of firm owned by officers and directors	25%	.60%	1.03%	1.14%	.01%	9.08%	2.46%	0%	.56%	1.22%	.52%
Total common stock return (1988-1992)	218.7%	-46.9%	-70.0%	-77.0%	-60.0%	-35.3%	-41.0%	-9.6%	-38.1%	37.1%	-12.2%

Source: Company annual reports, 10Ks and proxy statements, S&P stock reports, First Boston analysts' reports, J.P. Morgan analysts' reports.

a. Average COMEX price of gold in 1991 was \$362.

b. Cash costs include site costs for all mining (including deferred stripping costs), processing, and administration, but do not include royalties, capital costs, exploration costs, resource taxes, depreciation, and financing costs. Data courtesy of Paul Zink, J.P. Morgan. Barrick's definition of cash costs in Exhibit 1 includes its deferred stripping costs, by which the expenses of removing waste rock that lies above ore bodies is amortized over the life of the mine. Barrick's treatment of deferred stripping costs differs from that of other firms. The costs in this exhibit have been adjusted so that Barrick's costs can be directly compared against other mining firms' costs

c. Total costs add depreciation, royalties, capital costs, exploration costs, resource taxes, and financing costs to cash costs. Data courtesy of Paul Zink, J.P. Morgan.

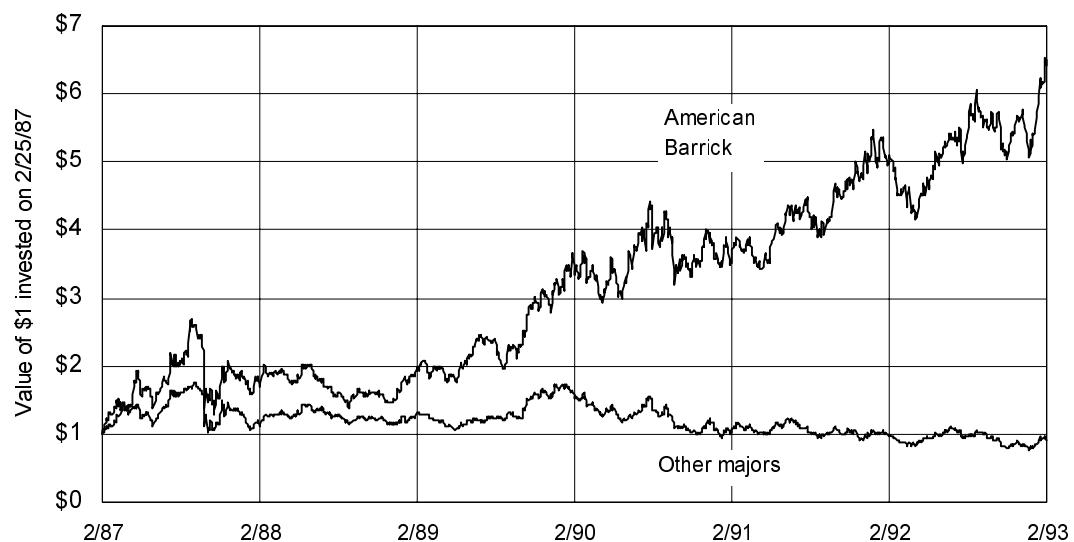
d. Reserve replacement costs are the sum of capitalized additions to exploration/development expenditures and exploration expenses divided by the net new ounces added to reserves for 1987-1991. Data courtesy of Paul Zink, J.P. Morgan.

e. At December 31, 1991. Data from Ted Reeve, "North American Hedging Report," First Boston Corporation, February 1992. (See **Exhibit 8** for details.)

f. FMC Corp. owns 79% of FMC Gold and hedged 88.7% of its share of 1992 production. FMC Gold officers and directors own 943,032 shares of FMC Corp.

g. Newmont Mining owned 90.1% of Newmont Gold and hedged 29% of its share of production as indicated.

**Exhibit 4** Return to American Barrick Common Stock and Common Stocks of Other Major Gold Mining Firms, 1987-1992

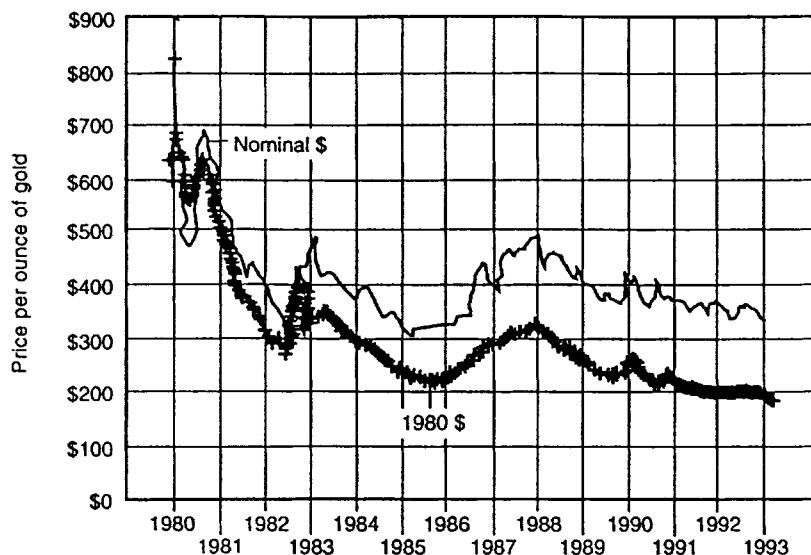


*Source:* Data from the Center for Research in Security Prices

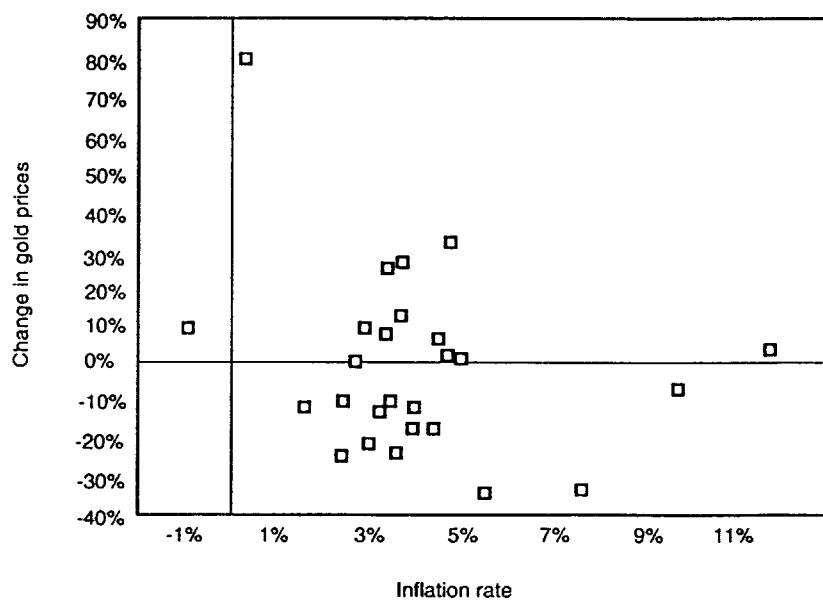
*Note:* This chart shows the value of \$1.00 invested in American Barrick on the date of its listing on the New York Stock Exchange (February 25, 1987) and reinvested in the shares of American Barrick as dividends were paid. The line labelled "Other Majors" shows the value of \$1.00 invested equally in the other major gold mines on the same date, and with dividends reinvested in an equal weighted portfolio of these firms. The "Other Majors" include AMAX, Battle Mountain, Echo Bay, FMC Gold, Homestake, International Corona, LAC Minerals, Newmont Gold, Newmont Mining, Pegasus, and Placer Dome.

**Exhibit 5** Price of Gold and the Relationship between Inflation Rates and Changes in Gold Prices, 1980-1992

**Price of gold per ounce in nominal and real (1980) dollars**



**Relation between inflation rates and changes in gold prices**



Source: Data from IDC Datasheet.

Note: Annualized inflation rates calculated for each non-overlapping six-month period from January 1980 to December 1992. Annualized changes in nominal gold prices are calculated for same periods.

**Exhibit 6** Percent of Production Covered by Price Risk Management Activities by Major North American Gold Producers, 1990-1992

Survey Date	Percent of Production Hedged					Spot Price at Time of Survey	Number of Firms Surveyed
	1991 <sup>a</sup>	1992 <sup>a</sup>	1993	1994	1995		
June 1990	22.7%	-	-	-	-	\$352	35
Sept. 1990	32.8	-	-	-	-	408	38
Dec. 1990	41.8	24.3%	16.1%	-	-	386	40
March 1991	49.0	25.3	16.4	-	-	356	47
June 1991	57.0	30.1	17.4	8.3%	-	368	53
Sept. 1991	53.1	31.1	18.7	14.0	-	349	53
Dec. 1991	-	37.4	21.5	15.3	-	353	52
March 1992	-	42.4	24.3	18.0	7.3%	341	52

Sources: Data from Ted Reeve, *North American Gold Monitor* and *Global Gold Hedge Survey*, First Boston Equity Research. Gold prices from IDC Datasheet.

a. Shows percent covered by price risk management activities as of date shown for the remainder of the year.

**Exhibit 7** Percent of Annual Production Covered by Price Risk Management Activities by North American Gold Mines at December 31, 1991

	1992	1993	1994	1995
Seniors	41%	21%	17%	7%
Intermediates	48	16	95	
Juniors	15	7	4	7
Total	39	18	13	6

Source: Data from Egizio Bianchini, *Gold Producers Based in North America, Hedging Survey*, Vol. II, Nesbitt Research, Spring 1992.

Note: Senior producers are those with estimated 1992 production of more than 400,000 oz. Intermediate producers have estimated 1992 production of 100,000 - 400,000 oz. Junior producers have estimated 1992 production of under 100,000 oz.

**Exhibit 8** Price Risk Management Activities of Eleven Leading North American Gold Mining Firms at December 31, 1991

	1992		1993			1994		
	Ounces	Price /oz.	Percent of Production	Ounces	Price /oz.	Percent of Production	Ounces	Price /oz.
<b>American Barrick</b>								
Forward Sales	289,273	\$415		—	—		—	—
Spot deferred	424,997	439		681,250	\$450		1,025,937	\$411
Gold loans	100,886	455		168,750	419		164,063	402
Puts	309,844	400		350,000	429		60,000	450
Total	1,125,000	424	94%	1,200,000	440	96%	1,250,000	412
Calls sold	—	—		140,000	449		18,000	450
<b>Amex Gold</b>								
Spot deferreds	139,880	507		—	—		—	—
Puts	12,000	410		42,000	425		42,000	440
Gold loans	4,000	400		—	—		—	—
Total	155,880	497	50	42,000	425	12	42,000	440
<b>Battle Mountain Gold</b>								
		0				0		0
<b>Echo Bay</b>								
Forward Sales	81,000	412		—	—		—	—
Gold loans	27,670	432		27,670	432		89,670	388
Total	108,670	417	15	27,670	432	4	89,670	388
<b>FMC Gold<sup>a</sup></b>								
		0				0		0
<b>Homestake</b>								
		0				0		0
<b>LAC Minerals</b>								
Forward Sales	840,000	395		488,000	399		—	—
Gold loans	52,500	414		70,000	414		70,000	414
Total	892,500	396	80	558,000	401	49	70,000	414
<b>Newmont Gold<sup>b</sup></b>								
		0				0		0
<b>Newmont Mining<sup>b</sup></b>								
Forward Sales	8,700	434		—	—		—	—
Gold loans	250,000	449		250,000	449		—	—
Puts	158,500	403		—	—		—	—
Total	417,200	431	29	250,000	449	16	0	0
Calls Sold	166,500	455		—	—		—	—
<b>Pegasus Gold</b>								
Forward Sales	114,065	420		44,565	494		50,565	492
Puts	150,000	350		—	—		—	—
Total	264,065	380	68	44,565	494	10	50,565	492
<b>Placer Dome</b>								
Forward Sales	372,000	425		231,000	427		231,000	427
Gold loans	7,000	431		10,000	431		10,000	431
Puts	34,000	378		—	—		—	—
Total	413,000	421	24	241,000	427	14	241,000	427
Calls sold	31,000	425		—	—		—	—
Calls purchased	7,000	435		—	—		—	—

Source: Data from Ted Reeve, *North American Hedging Report*, First Boston Corporation, February 1992.

a. The FMC Corporation owned 78.9% of FMC Gold and hedged its pro rata share of production. As of December 31, 1992, it had hedged 88.7% of its 1992, 79.6% of its 1993, and 0% of its 1994 share of production.

b. Newmont Mining owned 90.1% of Newmont Gold.

**Exhibit 9** Gold Lease Rate, LIBOR, Contango, Spot and Forward Gold Prices, 1982-1992

	Gold Lease Rate	LIBOR	Contango	Gold Price (per oz.)	Forward Price (per oz.)
Jan. 1982	1.35%	16.83%	15.48%	\$384.11	\$443.56
June 1982	1.45	15.63	14.18	314.93	359.59
Jan. 1983	0.65	9.45	8.80	479.88	522.11
June 1983	0.85	10.28	9.43	412.82	451.75
Jan. 1984	1.05	10.45	9.40	370.86	405.72
June 1984	1.25	13.40	12.15	377.64	423.53
Jan. 1985	1.35	9.60	8.25	302.77	327.75
June 1985	1.20	8.33	7.13	316.39	338.95
Jan. 1986	1.50	8.31	6.81	344.58	368.06
June 1986	1.50	7.60	6.10	342.77	363.68
Jan. 1987	1.20	6.19	4.99	408.31	428.69
June 1987	0.70	7.86	7.16	449.57	481.76
Jan. 1988	1.30	7.75	6.45	476.57	507.29
June 1988	1.45	8.24	6.79	451.34	481.96
Jan. 1989	1.70	9.77	8.07	403.99	436.60
June 1989	2.25	9.19	6.94	367.59	393.11
Jan. 1990	1.40	8.48	7.08	410.12	439.17
June 1990	1.45	8.54	7.09	352.31	377.28
Jan. 1991	2.40	7.40	5.00	384.47	403.70
June 1991	1.30	6.94	5.64	366.70	387.37
Jan. 1992	1.15	4.52	3.37	354.43	366.38
June 1992	1.10	4.54	3.44	340.80	352.52
December 31, 1992	1.80	4.06	2.26	333.33	340.86

Sources: IDC Datasheet, Reuters, Chase Manhattan Bank.

Note: Gold lease rates, LIBOR (London Interbank Offered Rate), contango, and forward prices are quoted for periods of one year. Data are averages for each month, except for December 31, 1992.

**Exhibit 10** American Barrick's Forward Sales of Gold (Excluding Gold Financings and Spot Deferred Contracts), 1984-1992

	Ounces Sold Forward (000s)	Date of Longest Forward Sale	Average Price at Delivery
1984	0	—	—
1985	79.4	12/86	\$336
1986	92.6	12/87	364
1987	37.9	1/89	497
1988	56.6	12/92	486
1989	117.4	12/91	427
1990	0	—	—
1991	0	—	—
1992	0	—	—

Source: American Barrick Resources Corporation, annual reports.

**Exhibit 11** American Barrick's Year End Gold Option Positions, 1983-1992

	Put Positions			Call Positions		
	Ounces in (000s)	Avg Exercise Price / oz.	Longest Maturity	Ounces (in 000s)	Avg Exercise Price / oz	Longest Maturity
1983	-	-	-	-	-	-
1984	-	-	-	-	-	-
1985	-	-	-	-	-	-
1986 <sup>a</sup>	-	-	-	- <sup>b</sup>	- <sup>b</sup>	- <sup>b</sup>
1987 <sup>c</sup>	549.3	\$426	3 years	215.4	\$578	3 years
1988 <sup>c</sup>	1,084.7	430	4 years	556.4	533	4 years
1989 <sup>c</sup>	1,700.0	417	4 years	886.9	461	4 years
1990 <sup>c</sup>	1,471.4	418	4 years	723.5	445	4 years
1991 <sup>c</sup>	1,009.1	417	3 years	447.3	427	3 years
1992 <sup>d</sup>	410.0	432	2 years	-	-	-

Source: American Barrick Resources Corporation, annual reports.

- a. In 1986, American Barrick entered into an agreement with a third party to carry out trading in gold options, with profits split equally and losses borne completely by the other party.
- b. On September 25, 1986, American Barrick issued 2,000,000 units at \$21.50 each, consisting of one share of common stock and two gold purchase warrants. Each warrant allowed the holder to buy .02 ounces of gold at \$9.20 (or \$460 per ounce) anytime over the following four years.
- c. In all years, the net premium paid for all new option positions was zero.
- d. In this year, American Barrick added no new options contracts to its position.

**Exhibit 12** American Barrick's Realized Price for Delivered Gold versus COMEX Spot Price, 1984-1992

	Average Price for Gold Delivered During Year	Average Ounces Delivered	COMEX Price
1984	\$311	34,078	\$360
1985	333	115,952	317
1986	348	185,359	368
1987	410	219,776	447
1988	446	330,479	437
1989	436	472,452	393
1990	437	575,656	384
1991	438	787,735	362
1992	422	1,280,320	345

Source: American Barrick Resources Corporation, annual reports.

**Exhibit 13** Public Disclosure of American Barrick's Consolidated Gold Price Risk Management Position at December 31, 1992

	1993		1994		1995	
	Ounces	Average Price	Ounces	Average Price	Ounces	Average Price
Gold loans <sup>a</sup>	33,750	\$515	224,063	\$402	213,125	\$400
Put options	350,000	429	60,000	450	—	—
Scheduled deliveries	383,750	437	284,063	412	213,125	400
Spot deferred contracts <sup>b</sup>	4,341,827	—	—	—	—	—

Source: American Barrick Resources Corporation.

a. Beyond 1995, the company had delivery obligations under its gold loans of 315,000 oz. at an average price of \$400 per ounce through to 1997.

b. Spot deferred contracts have no fixed delivery date and may be rolled forward for up to 10 years under the terms of American Barrick's trading agreements. On each rollover date the value of the contracts increases with the accumulation of the forward premium (contango). Uncommitted gold available from production will be delivered against these contracts when the spot price of gold is less than the price of the contracts. If the spot gold price exceeds the contract price, uncommitted gold available from production will be sold on the spot market and the contracts will be rolled forward for future delivery at a higher price through the accumulation of additional contango.

Assuming the spot price of gold remains below the contract prices, the company will realize a minimum average price of over \$400 per ounce for all its production through to the end of 1994. If the spot price exceeds the contract price, the company's average realized price will be higher as the contracts will be deferred for future delivery and production will be delivered into the higher spot market. From 1995 on, the minimum average price for the unutilized portion of the existing spot deferred contracts will be in excess of \$400 per ounce. Ultimately, Barrick's realized price could be significantly higher depending on the timing of deliveries and the forward premiums achieved.

**Exhibit 14** Projected Data on Meikle Mine Project

(Dollar figures in millions, except per ounce statistics)

	Amount <sup>a</sup>	Timing of Expenditure
Capital Costs prior to production <sup>b</sup>		
Surface facilities and mine shafts	\$55	mid-1993-1994
Underground development	\$31	1994-1995
Refrigeration and ventilation	\$12	1994-1995
Dewatering	\$23	1994-1995
Mine equipment	\$12	1995
Capitalized preproduction	<u>\$48</u>	mid-1993-1995
Total Capital Costs	\$180	
Operating costs per ounce of gold <sup>c</sup>	\$125	
Royalties <sup>d</sup> (percent of sales)	4%	
Estimated land reclamation costs at termination of project <sup>e</sup>	\$2.5	
Effective tax rate <sup>e</sup>	20%	

Source: American Barrick Resources Corporation.

- a. In 1992 dollars.
- b. Includes contingency of approximately 10%
- c. Planned reserves of 4.5 million ounces were projected to be produced over an 11-year period beginning in full production in 1996. Approximately 400,000 ounces of gold would be produced each year from 1996 to 2006.
- d. Royalties paid by American Barrick to the firm that had a royalty interest on the property on which the Meikle Mine was located.
- e. The taxation of gold mining firms is quite complex: mines can enjoy both depreciation and depletion tax benefits. The effect of these tax shields was to reduce American Barrick's effective tax rate on its operating profits on the Meikle Mine to approximately 20%.

**Exhibit 15** Gold Prices and Other Capital Markets Data, 1990-1992

	Jan. 1990	June 1990	Jan. 1991	June 1991	Jan. 1992	June 1992	Dec. 1992
Gold price per ounce	\$410	\$352	\$385	\$367	\$354	\$341	\$333
US\$ interest rates							
LIBOR: 1 year	8.48%	8.54%	7.40%	6.94%	4.52%	4.54%	4.06%
1-year Treasuries	7.92	8.10	6.65	6.36	4.15	4.17	3.61
3 years	8.13	8.40	7.38	7.39	5.40	5.60	4.93
5 years	8.12	8.43	7.70	7.94	6.24	6.48	5.83
Gold lease rates:							
1 year	1.40%	1.45	2.40	1.30	1.15	1.10	1.80
3 years	2.90	2.80	3.50	2.60	2.10	1.80	2.25
5 years	4.00	3.75	4.75	3.50	2.90	2.25	2.70
Implied volatility of gold <sup>a</sup>	-----18%-----		-----12%-----		-----9%-----		7%

Sources: American Barrick Resources Corporation, IDC Datasheet, Chase Manhattan Bank, and Paul H. Zink, *The North American Gold Industry: A Market in Transition*, J.P. Morgan Report, July 1, 1992.

Note: All data except for implied volatilities are averages for each month, except for December 31, 1992. Implied volatility figures are annual estimates, except for December 1992, which is a monthly estimate.

- a. Approximate implied volatilities on European options on gold with maturities of five years or less. Implied volatilities for gold options had been over 50% in 1980, about 18% in 1987, and 12% in 1988 and 1989. In late January 1991, implied volatilities reached over 20%.